



# CONCEPTUAL WETLAND MITIGATION PLAN

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I-69 EXTENSION PROJECT  
PETERSBURG-HANNA 345 KV TRANSMISSION LINE  
GREENE COUNTY, INDIANA

JANUARY 2011

**PREPARED FOR:**

INDIANAPOLIS POWER & LIGHT COMPANY  
INDIANAPOLIS, INDIANA

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## **APPENDICES**

APPENDIX A: CONCEPTUAL SITE DEVELOPMENT PLAN

## 1.0 INTRODUCTION

In August of 2010, the Indiana Department of Transportation (INDOT) notified Indianapolis Power and Light Company (IPL) that sections of both the Petersburg-Hanna and the Petersburg-Thompson 345 kV transmission lines would need to be relocated because they conflicted with the new proposed right-of-way for the interstate. A subsequent review of INDOT-provided site plans, as well as other documents by IPL identified 21 structures that would need to be removed and relocated. The review also determined that 14 of the 21 structures could be moved back or forward (in-line) within the right-of-ways of the transmission lines, but seven could not because of conflicts with topography, land use, potential resource impacts, and incompatible alignments of the existing transmission line and proposed interstate. IPL determined that these structures would need to be moved outside of the existing right-of-ways (off-line), which would require the acquisition of new right-of-way easements and, because the new right-of-ways would be longer and would require more conductor cable, the addition of several new support structures.

On September 15, and October 28, 2010, the Mannik & Smith Group, Inc. performed wetland studies for Commonwealth Associates, Inc. on behalf of IPL along the existing and proposed 345 kV transmission line rights-of-way in Greene, Daviess, and Pike Counties, Indiana (see Appendix A: Project Location Map). Attempts were then made by both IPL and Commonwealth to minimize impacts to resources by adjusting proposed routes and structure locations. However, total avoidance of wetland resources was not feasible. In order to relocate the part of the Petersburg-Hanna line that was conflicting with the proposed interstate and interchange at the intersection of US231/SR58, a new right-of-way would be needed. The route that was selected will require clearing a new corridor through a regulated partially forested wetland and installing a new transmission line support structure within the wetland. Clearing the corridor will impact approximately 2.8 acres of wetland, of which 2.1 acres (91,681 square feet) are forested. Installing the new support structure will require excavating 210 cubic yards of native sand and clay from the wetland and placing approximately 224 cubic yards of concrete back into the wetland. The amount of wetland that will be permanently impacted by the concrete is approximately 191 square feet. The area of wetland that would be impacted by the structure is also within the area to be cleared.

The Indiana Department of Environmental Management (IDEM) requires mitigation for permanent wetland impacts that are greater than 0.10 acre. This includes secondary impacts, such as converting one wetland type to another wetland type. Because this project will require partially clearing a forested wetland to establish a new corridor and the new corridor will need to be kept clear of trees permanently, the proposed impact is considered a conversion of a forested wetland type to a non-forested type, most likely herbaceous. IDEM has determined that compensatory mitigation for the conversion is required. Off-site mitigation for conversion of wetland type is proposed at a ratio of three acres of wetland to be created for every acre of wetland impacted. Based on that ratio and the impact being proposed, a new 6.3-acre wetland will need to be created.



This plan addresses the required mitigation. While only conceptual, it does provide a basic framework from which a more formal and detailed final wetland mitigation plan can be developed.

## 2.0 MITIGATION OPTIONS

### *On-site wetland mitigation*

On-site wetland mitigation is not feasible. The land IPL controls is limited to the utility right-of-way. For safety reasons, trees cannot be allowed within the utility right-of-way. Furthermore, constructing new wetlands in the adjacent uplands is not feasible. The adjacent uplands to the south are heavily wooded and hilly. Converting this area to wetlands would require clearing trees and significant grading. Due to the potential habitat for the endangered Indiana Bat, clearing of the trees is not desirable.

### *Off-site wetland mitigation*

Off-site wetland mitigation must be within the same eight-digit U.S. Geological Service, Hydrologic Unit Code (HUC) or county as the wetland to be impacted. The HUC for this site is 05120202, Lower White River, and the county is Greene.

Forms of off-site mitigation include restoration of historic wetlands, converting uplands adjacent to an existing wetland complex or a drainage way (ditch, stream, river, pond, etc.).

### *Purchase of mitigation credits*

Currently, there are no approved mitigation banks within the Lower White River HUC, or in Greene County.

### *Preservation of exempt isolated wetlands*

Because exempt isolated wetlands tend to be small, this option may prove problematic in attempting to meet the required mitigation acreage. However, it will be explored.

## 3.0 MITIGATION GOALS

The goal of the mitigation is to develop a wetland that provides ecological and aesthetic values similar or greater than the wetland impacted. The mitigation area will provide wildlife habitat, riparian buffering, and open space. The trees planted will provide habitat for a variety of birds, mammals, and insects, absorb nutrients, stabilize soil, and filter storm water run-off. The area will be converted to open space through the regulatory nature of mitigation.

## 4.0 MITIGATION WORK PLAN

At this time, a site for the mitigation has not been identified. IPL is currently working on identifying a suitable site. The mitigation work plan includes identifying a suitable site; performing preconstruction investigations, including surveying and hydrologic and soil analysis; developing a detailed site plan; site preparation; vegetative establishment; and monitoring.

Once a suitable mitigation site has been identified, a survey will be conducted to determine the topographic relief with the area. The survey will be of an area at least as large as the

required mitigation area and adjacent uplands to show the limits of proposed grading, hydrological connection to an existing wetland and/or drainage way and access to the mitigation site for construction. A hydrologic analysis of the site will be performed to determine existing surface hydrologic functions. Soils within the mitigation site will be analyzed to determine their drainage capability and to identify hydric and substrate soils to supplement the mitigation.

Based on the survey and analyses, a detailed site plan will then be developed. The site plan will incorporate aspects of the conceptual site plan and mitigation plan and will be included in the final mitigation plan. The final mitigation plan will expand upon information provided in the conceptual plans and address additional details, such as the location and selection of the mitigation area, the introduction of hydrology and soils, construction, vegetation establishment, monitoring of the mitigation area, and easements. The final plan will then be submitted to IDEM for review and approval.

Within 6 months after the permit has been issued by IDEM, the final mitigation plan shall then be submitted. Construction of the mitigation area shall be complete within 12 months of approval of the final plan by IDEM.

Upon completion of construction and installation of plant material, the mitigation area shall be surveyed and an "As-built" drawing submitted to IDEM. The drawing shall be submitted within three months of completion.

Upon completion, the mitigation area shall be monitored. Yearly monitoring reports shall be submitted to IDEM as outlined below.

## **5.0 CONCEPTUAL SITE DEVELOPMENT PLAN**

A conceptual site development plan is attached as Appendix A. This plan shows the intent to create a wooded wetland adjacent to a large wetland complex or drainage way. The intent is to create a wetland by hydrologically connecting the mitigation area to the existing complex. The plan shows a conceptual mitigation area approximately 300,000 square feet in size that has been excavated from uplands. The area is larger than the required 6.3 acres to allow for transitional areas and because 100% success of the mitigation area is unlikely.

Once a site has been identified, additional drawings and details, such as the following plans and maps, will be provided as part of the site development plan.

### *Site Location Map*

Although a specific site has not been identified, the proposed site will be within the Lower White River watershed and/or Greene County, Indiana. The site will be adjacent to an existing wetland complex or other suitable drainage way.

### *Grading Plan*

In order to provide the necessary hydrology to support wetland development, some form of earthwork is likely. The grading plan will show the proposed high and low spots of the mitigation area and the connection to the existing wetland complex or drainage way.



### *Planting Plan*

A detailed wetland planting plan will be developed to provide specifications for the number of each species of plant to be planted. This will include the scientific and common name of the plant, the size of the specimen to be installed, the application rate for seeding, the source of the planting material, and the planting method. In order to establish a wooded wetland, the planting plan will identify a mix of trees, grasses, and sedges, as well as an herbaceous cover crop. As an actual site has not been selected, the final plan may have some modification of plant species and seed application rate; however, the following planting scheme is suitable for establishing a wooded wetland in southwestern Indiana.

### **Trees**

Trees shall be 12-15" bare root seedlings of wetland species native to southwestern Indiana. These seedlings shall be supplied by the JFNew Company and shall be commercially grown in Indiana or the adjacent states of Illinois, Ohio, or Michigan. A total of 2,520 seedlings will be planted on 10 foot x 10 foot centers. A minimum of 300 and no more than 500 of each species of the following shall be planted.

<u>Botanical Name</u>	<u>Common Name</u>
Acer rubrum	Red Maple
Acer saccharinum	Silver Maple
Betula nigra	River Birch
Platanus occidentalis	American Sycamore
Quercus palustris	Pin Oak
Ulmus americana	American Elm

### **Shrubs**

Shrubs shall be 8-12" bare root seedlings of wetland species native to southwestern Indiana. These seedlings shall be supplied by the JFNew Company and shall be commercially grown in Indiana or the adjacent states of Illinois, Ohio, or Michigan. A total of 5,500 seedlings will be planted on 7 foot x 7 foot centers. A minimum of 700 and no more than 1,500 of each species of the following shall be planted.

<u>Botanical Name</u>	<u>Common Name</u>
Cornus amomum	Silky Dogwood
Cornus sericea	Red-Osier Dogwood
Lindera benzoin	Spicebush
Physocarpus opulifolius	Ninebark
Sambucus Canadensis	Elderberry
Viburnum dentatum	Arrowwood Viburnum

### **Herbaceous Species**

A wooded wetland seed mix shall be applied at the rate of 32.8 PLS pounds per acre. The mix shall be supplied by JFNew Company and shall be free of any invasive or noxious species as identified by IDEM and the US Department of Agriculture.

<u>Botanical Name</u>	<u>Common Name</u>	<u>Ounces/Acre</u>
<b><i>Permanent Grasses/Sedges:</i></b>		
Calamagrostis canadensis	Bluejoint Grass	1.00

Carex crinita	Fringed Sedge	2.00
Carex lupulina	Common Hop Sedge	4.00
Carex lurida	Bottlebrush Sedge	1.50
Carex frankii	Bristly Cattail Sedge	3.00
Carex squarosa	Narrow-Leaved Cattail Sedge	1.00
Carex typhinea	Common Cattail Sedge	1.00
Carex vulpinoidea	Brown Fox Sedge	4.00
Elymus virginicus	Virginia Wild Rye	20.00
Glyceria striata	Fowl Manna Grass	2.00
Leersia oryzoides	Rice Cut Grass	2.00
Scirpus atrovirens	Dark Green Rush	2.00
Spartina pectinata	Prairie Cord Grass	1.00

**Temporary Cover:**

Avena sativa	Common Oat	360.00
Lolium multiflorum	Annual Rye	100.00

**Forbs:**

Alisma spp.	Water Plantain (Various Mix)	3.00
Angelica altropurpurea	Great Angelica	1.00
Aster puniceus	Bristly Aster	0.75
Aster umbellatus	Flat-Top Aster	0.25
Bidens cernua	Nodding Bur Marigold	2.50
Campanula americanus	Tall Bellflower	0.25
Cephalanthus occidentalis	Buttonbush	0.50
Helenium autumnale	Sneezeweed	2.00
Heracleum lanatum	Cow Parsnip	0.75
Hibiscus moscheutos	Swamp Rose Mallow	2.00
Lobelia siphilitica	Great Blue Lobelia	1.50
Lycopus americanus	Common Water Horehound	0.25
Mimulus ringens	Monkey Flower	1.25
Penthorum sedoides	Ditch Stonecrop	0.50
Polygonum spp.	inkweed (Various Mix)	0.50
Rudbeckia laciniata	Wild Golden Glow	0.75
Verbesina alternifolia	Wingstem	2.00

**Adjacent disturbed uplands**

In addition to seeding the mitigation area, all disturbed unpaved upland areas adjacent to the mitigation area shall be stabilized with an upland seed mix and mulched. Areas previously used for agricultural purposes outside of the wetland buffer shall be returned to pre-construction condition, and seeding and mulching may not be required in these areas if they will be returned to agriculture. Suggested seed mix is JFNew Slope Stabilization mix distributed at a rate of 59.5 PLS pounds per acre.

<u>Botanical Name</u>	<u>Common Name</u>	<u>Ounces/Acre</u>
Andropogon gerardii	Big Bluestem	48.00
Bouteloua curtipendula	Side-Oats Grama	16.00
Carex spp.	Prairie Sedge Mix	4.00



Elymus canadensis	Canada Wild Rye	32.00
Elymus virginicus	Virginia Wild Rye	24.00
Panicum virgatum	Switch Grass	12.00
Schizachyrium scoparium	Little Bluestem	32.00
Sorghastrum nutans	Indian Grass	32.00
Avena sativa	Common Oat	512.00
Lolium multiflorum	Annual Rye	240.00

#### **Soil Augmentation**

Soils play an important role in wetland development. If on-site soils are insufficient to support wetland development, suitable soils will be imported from a commercial source, or manufactured.

### **6.0 WETLAND MONITORING & CONTINGENCY FOR SUCCESS**

The wetland mitigation area shall be monitored in accordance with IDEM requirements. Monitoring will include placing permanently staked transects within the mitigation area, randomly placing sample plots along each of the transects, and then collecting vegetation, soils, and hydrology data from the area in and around each plot. Photos will also be taken during monitoring activities to allow visual reference of the progression of the site. The same transect positions will be used year to year for accurate comparison analysis.

Monitoring will take semi-annually, once at the beginning of the growing season and once at the end of the growing season. Monitoring reports will be submitted to IDEM by the 31<sup>st</sup> of each year for a minimum of three years beginning after the first full growing season. In the report, the status of hydrology and soils will be documented to determine changes and progression. Vegetation will be documented in terms of species richness, percent cover, and frequency of each species. Throughout the monitoring period, any maintenance activities that take place will be recorded and included in the report. Additional seeding, grading, and removal of invasive species will be performed as needed to assure the goals of the mitigation plan are being met. Monitoring can end after the three-year period if the mitigation success criteria have been met for two years. Monitoring will continue for an additional two years for a total of five years, if mitigation success criteria have not been met during two out of the three first years.

### **7.0 MITIGATION SUCCESS CRITERIA**

The following Minimum Success Criteria for wetland compensatory mitigation will be utilized for the proposed mitigation area.

- The area of the established wetland is equal to or greater than 6.3 acres.
- The average density of live individual tree and shrub species is no less than 300 individuals per acre, including planted species and native volunteer species greater than 12 inches in height.
- More than 50% of the vegetation species in the established wetland have a wetland indicator of facultative (FAC) or wetter. The wetland indicator status of each



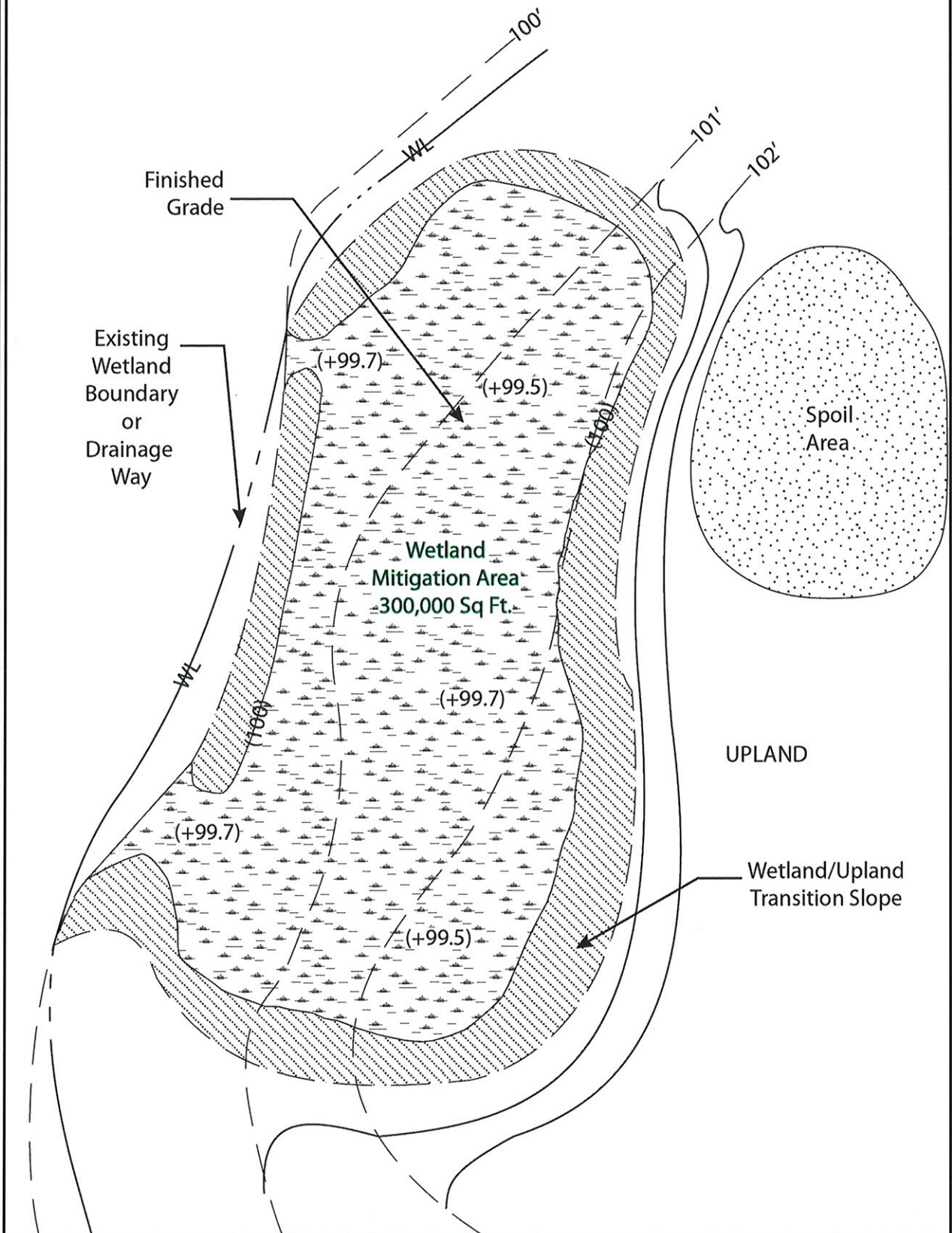
dominant species will be determined using the National List of Plant Species that Occur in Wetlands Region 3 - Midwest (1993) or subsequent publications, as approved by IDEM.

- The hydrology in the established wetland meets the wetland hydrology criteria of the U.S. Army Corps of Engineers, as contained in the Corps of Engineers Wetlands Delineation Manual, Wetlands Research Program Technical Report Y-87-1 (January 1987) and Regional Supplement to the Corps of Engineers Delineation Manual: Midwest Region (Version 2.0, 2010).
- The combined surface areal coverage of *Phalaris arundinacea* (Reed Canary Grass) and *Typha* spp. (Cattail) in the established wetland is less than or equal to 15% of the total area of the mitigation area.
- The established wetland is free of *Lythrum salicaria* (Purple Loosestife), *Phragmites australis* (Common Reed Grass) and *Myriophyllum spicatum* (Water Milfoil).
- Native plant species, excluding *Typha* spp. (Cattail), have an areal cover of at least 70%.
- Less than 10% of the surface area coverage of the established wetland is open water and/or bare ground. Open water and bare ground are defined as areas with less than 10% aerial vegetative cover.

#### **8.0 MITIGATION PROTECTION**

The mitigation site will be properly managed and maintained. IPL shall protect the mitigation area by a permanent conservation easement or similar instrument that provides for the permanent protection of the natural resource functions and values of the mitigation site.

# CONCEPTUAL SITE DEVELOPMENT PLAN



Mitigated Wetland Transition Slope Existing Contour Lines	Drainage Way Spoil Area	 2700 W. Argyle Street Jackson, Michigan 49202 Corp: (517) 788-3000 Fax: (517) 788-3003 www.cai-engr.com	
 <b>N</b>	January 06, 2011 Scale: 1" = 150' Drawn By: JEK	0 75 150 300 Feet	Sheet 01 of 01